

only figures the upper-side, I do not see that this distinction would hold, and I find that our palest specimens have practically no central spots on the under-sides, but that these spots which are absent in the pale forms gradually increase in intensity with the depth of colour on the upper surface. He also gives different dates for the appearance of his *arundineta*; but Mr. Warren (Ent. Mo. Mag., vol. xxii, p. 256) shows that *neurica* in Norfolk is a fortnight earlier than the same species in Cambridge. I believe the dark form (*dissoluta*) used to occur in the Norfolk and Cambridge Fens, but Dr. Staudinger himself groups *arundineta*, Schmidt, with *dissoluta*, Treitschke, and our species now gives us both *neurica*, Hb., and *arundineta*, Schmidt.

There can be no doubt, therefore, that the synonymy should stand:—

*Nonagria neurica*, Hb., Sta.

(a) var. *dissoluta*, Treitschke.

(b) var. *arundineta*, Schmidt.

Westcombe Park, S.E.:

June 10th, 1888.

#### NOTES ON SOME BRITISH AND EXOTIC COCCIDÆ (No. 9).

BY J. W. DOUGLAS, F.E.S.

##### LECANIUM LAURI.

*Coccus lauri*, Boisd., Ent. Hort., p. 353 (1867). *Lecanium lauri*, Sign., Ess. Cochen., p. 230 (1873).

♀. Long broad-ovate, or when alongside the midrib of a leaf, nearly straight on the side appressed to it, flattened, yellowish-brown; the middle portion of the disc, that is, over the insect beneath, with a median, blunt, slight elevation, of varying development; on each side of this, for some distance, the surface is deeply and coarsely punctured, the foveate punctures on their base, under the power of a half-inch objective, appear as large black perforations of the integument, but there is no reticulation or tessellation; exterior to this portion the wide field, up to the margin all round, is finely rayed transversely, and anteriorly has also on each side two distant, fine, yellow carinæ going obliquely from the punctured portion to the margin, these become more or less obsolete in the old examples, but then the median elevation mostly becomes sharper and more like a carina. Under-side glossy, greenish-yellow with brown shades, usually more decided on the sides of the abdomen. Antennæ slender, of 7 joints. Length, 3·5—3·8, breadth, 2·5—2·6 mm.

No male scales seen.

Signoret (*l. c.*) appears to doubt if this form be separable from *L. hesperidum*; and this is true as regards the young stage, where the likeness of one to the other is very great; but in the adult the broader form, the strong puncturing of the disc, and generally darker colour, seem to me to be of distinct specific value; moreover, while *L. hespe-*

*ridum* is found on orange trees and many other plants, *L. lauri* is attached exclusively to the bay tree (*Laurus nobilis*), which flourishes in this country, especially in the southern counties, in the open air.

On the 16th January last Dr. D. Sharp sent to me from his garden at Shirley Warren, Southampton, some terminal shoots of bay, on the leaves of which the scales of this species were numerous, and in all stages of growth; there were also a few on the stems. As a rule the scales were attached to the lower surface of the leaves, but a few were on the upper side, and all were alive and healthy—a rare thing with *Lecanium*, at this season, in this country. I think the females are viviparous, and that the species belongs to the (so-called) parthenogenetic set (*c. f.*, p. 25—27, vol. xxiv).

On the 9th of April, on a small bay tree here in Beaufort Gardens, I found a few scales; both adult with young beneath, and others of small size immature, indicating a progressive generation of the species, as in *L. hesperidum*.

#### LECANIUM CLYPEATUM, *n. sp.*

♀ scale in the early stages, and up to the time of gestation, narrow, pearl-white, with strong carinate ridges, viz., one on the middle of the back, crossed towards each end of the scale by a similar one extending at a right angle to the margin on either side, the spaces between the ridges, especially on the sides, very concave, as if by compression; the surface or hypoderm (as Targioni-Tozzetti has it) covered with minute pale dots; these become more evident when the scale gets brown, as it does eventually, the length being about 3.5 mm. In this ridged condition of immaturity the scales are void, but after the fertilization of the insects they become filled with eggs, the ridges disappear, the cavities fill up, and the form is a broad-oval, very convex, the dorsum with a row of 4—6 very small tubercles, sometimes two or three rows; sides more or less straight, the margin not extended and flattened, except anteriorly, as far back as the region of the primary lateral ridges, where it is greatly produced, clypeiform, in some examples to an obtuse point, mostly slightly recurved at the edge, and rough with strong punctures; sometimes also with a rough longitudinal median carina. Viewed from the side, the scale, in the region of the previous dorsal carina, is more or less level, but it then curves somewhat suddenly both to the front and back. When mature the scale is ochreous-brown, and slightly shorter than when immature. Under-side all pale; margin with fine, distant, horizontal hairs; antennæ of 8 joints; 1st and 2nd short, 1st shortest, 3rd longest, 4th and 5th a little shorter, 6th, 7th and 8th short with long hairs; legs short, tarsi nearly half the length of the tibiæ, articulation therewith distinct; claws short, digitules ordinary.

Length, 3—4, breadth, 2—2.5, height, 1.5 mm.

Male unknown.

In general appearance the adult scale resembles *L. flicum*, but differs from it in the absence of the flattened margin and in the presence of the clypeate extension of the margin anteriorly—a characteristic of the species.

I first obtained the white form, along with the mature scales, on *Adiantum capillus veneris* in the conservatory of Mr. W. Morris at Deptford, in April, 1887; and in February last I received some, on another fern, from Rev. W. F. Johnson, Armagh. I have also had the mature form from Mr. P. Cameron, Sale, on *Bryophyllum calycinum* and *Asparagus plumosus*.

#### LECANIUM BITUBERCULATUM.

*Lecanium bituberculatum* (Targ.-Tozz.), Sign., Ess. Cochen., p. 244.

♀ scale chocolate-brown or grey-brown, with yellowish tints in places, broad-oval, very convex, the upper part of irregular contour, with two pairs of dark, shining tubercles, each tubercle of a pair placed near to and in a line with the other, the posterior ones larger, more conical, darker, and more polished than the anterior; between the tubercles, on the median line, is a broad, flat ridge, which is continued forwards for some distance, and then ends abruptly at a large depression, from which, at a low level, a very fine raised line goes to the anterior margin: behind the tubercles the median flat ridge extends a little, and then merges into a slight carina, which goes to the anal cleft; this is long, fusiform, open, and the aperture has raised margins; the scale has a broad marginal field more or less freckled or banded with yellow or ashy-white, and with large confluent punctures; on the posterior portion of the sides of the scale this field is crossed by four or five short carinæ, and one, immediately below the larger tubercle, longer and stronger.

Length, 4.5, breadth, 3, height, 2 mm.

The specimens I have being dessicated I have to borrow from Signoret the description of the parts I am unable to see:—"The antennæ have 7 joints; the 4th being the longest, with four long hairs at the extremity; 5th and 6th the shortest, 7th a little longer, equal to the 3rd. Legs difficult to eliminate, twenty examples were destroyed before a view of an entire one could be obtained; tarsus one-third less than the tibia, with three hairs towards the end; claw rather broad at the base, with two digitules *en forme de cornet*.

"The ♀ larva has 6 joints in the antennæ, of which the 3rd is the longest. The ♂ larva is much longer, and has 7 joints in the antennæ, of which the 7th (very long and equalling the 4th) has four hairs at the end. The dorsal surface has very small and proximate cellular punctures, especially towards the margin."

The ♂ imago is not described. Of the ♀, Signoret says the scale is very variable in size, sometimes attaining 5 mm. in length, 4 in breadth, and 3 in height, according to the circumstances of its position on a small or large site. His figure represents the dorsal tubercles as of nearly equal length, whereas his description states that two are smaller than the others; a lateral tubercle is also shown which is not mentioned in the description, and which I do not find; it is doubtless meant to represent the carina below the larger tubercle. The lateral carinæ are not figured nor described, the smaller ones are frequently not very evident, but the large one always is. But in all the main points my examples agree so well with Signoret's description as to leave no doubt of the specific identity of this remarkable form. It appears to be subject to some variation, for Signoret mentions that, on some of the specimens he received from Florence the anterior smaller tubercles were wanting;

others had on the disc an irregular pale yellow spot, more or less fimbriate, which he thinks may have been the result of the attack of parasites.

In his "Catalogus," p. 33, No. 18, Targioni-Tozzetti indicates "*Lecanium bituberculatum*, nob., *sp. n.*," but without description; under this name it was sent to Signoret, who described it, *l. c.*; he says of it, "Ce *Lecanium* est un des plus jolis," and states that it is common on whitethorn at Florence and in the South of France.

On February 15th last Mr. E. Parfitt sent from Exeter one, and on March 20th the other of the two scales described above, which he had just found on twigs of hawthorn (*Cratægus oxyacantha*) in a hedge; this is the first time the species is known to have been taken in Britain. On the 4th of April, on a hawthorn hedge at Lee, within a space of two yards, I found 24 scales of this species, always on shoots of last year's growth, sometimes singly, at others two or three close together, mostly at the base of a thorn or bud; but they were localized, for I sought in vain for more in other parts of the hedge.

Being very much of the colour of the wood, and not unlike the buds about to open, they might easily be overlooked, and I might not have seen them but that by having Mr. Parfitt's specimens I knew what to look for; when the leaves are out it would be as much as a bird or a parasitic insect could do to find the scales. But no bird cares to molest them, or it would have attacked them in their unprotected condition during the winter, and the parasite, if there be one, is already within the shell. I observe that there is in the scales a certain range of variation in form and colour, and the small tubercles (which are at times behind and not before the large ones) are often wanting; but the distinctive characters of this remarkable scale are always present. On the under-side the margin all round is greatly widened inwardly, forming a broad, flat ledge for adherence to the site, a provision against the roughness of winter, most advantageous to scales containing the germs of the next generation. As a rule, the female scales of the *Lecania* in general fall off after the larvæ have come out from them in the summer, and the few that may happen to remain during the winter are slightly attached, empty, dull and tarnished, but these of *L. bituberculatum* after hibernation are tightly adherent, fresh and bright, and contain each 200 to 250, or more, loose, plump, pale yellow eggs. It is quite possible that these may produce a summer brood, from which the scales to be found in the spring may come; but this is only theoretical.

8, Beaufort Gardens, Lewisham :

April, 1888.